

Listing of Claims:

Please amend the claims of the application as follows. This Listing of Claims will replace all prior versions and listings of claims in the application:

Claims

1. – 31. (Canceled)

32. (New) A method for producing chemically-doped boron doped with a dopant amount of a desired dopant element comprising the steps of: mixing a boron compound in a vapor state with a boron-compound reducing gas and a controlled amount of a material containing the dopant element, said material being in a vapor state or entrained in a vapor, to form a gaseous mixture; and, heating the gaseous mixture in a reaction vessel to a reaction temperature to produce chemically-doped boron doped with the dopant element.

33. (New) A method according to claim 32 wherein said reducing gas is hydrogen gas.

34. (New) A method according to claim 32 wherein said boron compound in a vapor state is boron trichloride.

35. (New) A method according to claim 32 wherein said boron compound in a vapor state is boron trichloride, said reducing gas is hydrogen gas, and wherein they are mixed in roughly stoichiometric proportions.

36. (New) A method according to claim 32 wherein said material containing the dopant element is selected from the group consisting of titanium tetrachloride, methyltrichlorosilane, and methane.

37. (New) A method according to claim 32 for producing boron doped with titanium wherein the reducing gas is hydrogen gas, the material containing the dopant element is titanium tetrachloride, and at least a portion of the hydrogen gas is bubbled through liquid titanium tetrachloride to form a hydrogen/titanium tetrachloride mixture that is subsequently mixed with the boron compound in a vapor state.

38. (New) A method according to claim 32 for producing boron doped with silicon wherein the reducing gas is hydrogen gas, the material containing the dopant element is methyltrichlorosilane, and at least a portion of the hydrogen gas is bubbled through liquid methyltrichlorosilane to form a hydrogen/methyltrichlorosilane mixture that is subsequently mixed with the boron compound in a vapor state.

39. (New) A method according to claim 32 for producing boron doped with carbon wherein the reducing gas is hydrogen and the material containing the dopant element is methane.

40. (New) A method according to claim 32 wherein said dopant amount of the desired dopant element in the chemically-doped boron ranges up to about 10 atomic percent.

41. (New) A method according to claim 37 wherein the chemically-doped boron consists of about 90 atomic percent boron and about 10 atomic percent titanium.

42. (New) A method according to claim 38 wherein the chemically-doped boron consists of about 1.5 to 8.1 atomic percent silicon.

43. (New) A method according to claim 39 wherein the chemically-doped boron consists of about 1.5 to 6.3 atomic percent carbon.

44. (New) In a chemical vapor deposition process wherein a boron compound in a vapor state is mixed with a boron compound reducing gas to form a reaction mixture, and the reaction mixture is heated to a reaction temperature to form boron and a reduction product, the improvement comprising the step of adding to the reaction mixture a

controlled amount of a material containing a dopant element to form chemically-doped boron doped with a dopant amount of the dopant element.

45. (New) In the process of claim 44, the step of using hydrogen as the reducing gas.

46. (New) In the process of claim 44, the step of using boron trichloride as the boron compound in a vapor state.

47. (New) In the process of claim 44, the step of using boron trichloride as the boron compound in a vapor state, hydrogen gas as the reducing gas, and wherein the boron trichloride and hydrogen gas are mixed in roughly stoichiometric proportions.

48. (New) In the process of claim 44, the step of selecting the material containing the dopant element from the group consisting of titanium tetrachloride, methyltrichlorosilane, and methane.

49. (New) In the process of claim 44, producing boron doped with titanium by the steps of: using hydrogen gas as the reducing gas, using titanium tetrachloride as the material containing the dopant element, bubbling at least a portion of the hydrogen

gas through liquid titanium tetrachloride to form a hydrogen/titanium tetrachloride mixture, and mixing the hydrogen/titanium tetrachloride mixture with the boron compound in a vapor state to form the reaction mixture.

50. (New) In the process of claim 44, producing boron doped with silicon by the steps of: using hydrogen gas as the reducing gas, using methyltrichlorosilane as the material containing the dopant element, bubbling at least a portion of the hydrogen gas through liquid methyltrichlorosilane to form a hydrogen/methyltrichlorosilane mixture, and mixing the hydrogen/methyltrichlorosilane with the boron compound in a vapor state to form the reaction mixture.

51. (New) In the process of claim 44, producing boron doped with carbon by the steps of: using hydrogen gas as the reducing gas and using methane as the material containing the dopant element.

52. (New) In the process of claim 44, the step of providing a proportion of the material containing a dopant element relative to the proportion of the boron compound in the reaction mixture such that the dopant amount of the dopant element in the chemically-doped boron ranges up to about 10 atomic percent.

53. (New) In the process of claim 49, the step of providing a proportion of the titanium tetrachloride relative to the proportion of the boron compound in the reaction

mixture such that the chemically-doped boron consists of about 90 atomic percent boron and about 10 atomic percent titanium.

54. (New) In the process of claim 50, the step of providing a proportion of the methyltrichlorosilane relative to the proportion of the boron compound in the reaction mixture such that the chemically-doped boron consists of about 1.5 to 8.1 atomic percent silicon.

55. (New) In the process of claim 51, the step of providing a proportion of the methane relative to the proportion of the boron compound in the reaction mixture such that the chemically-doped boron consists of about 1.5 to 6.3 atomic percent carbon.